

## BACKGROUND OF THE INVENTION

*This application is a DIV of 09/521,512 03/08/2000  
PAT 6,625,189.*

## 1. FIELD OF THE INVENTION:

The present invention relates to a semiconductor laser device suitable for use as a light source which is used for long distance, large optical communication. The present invention further relates to a method for fabricating such a semiconductor laser device.

## 2. DESCRIPTION OF THE RELATED ART:

In order to realize a semiconductor laser having an improved rapid response property, which is used for long distance, large data transmission, it has been attempted to apply a quantum wire structure to an active layer of a semiconductor laser. The quantum wire structure has a high gain property relative to a quantum thin film structure. In addition, it is theoretically presumed that the semiconductor laser having the quantum wire structure operates with a small current, with high efficiency, and with narrow spectral linewidth (M. Asada et al., IEEE JOE, vol. QE-22, No.9, pp.1915-1921, 1986).

Figure 6 shows a conventional semiconductor laser device 600 having a quantum wire structure (Arai et al., Proceedings of Electronics Society Conference of Institute of Electronics, Information and Communication Engineers, 1997, pp. 266-267). As shown, double-quantum well active regions 602 each having a trapezoid shape are formed above an InP substrate 601, and the width of the trapezoid is about 35 nm in the center portion thereof. The well regions 602 each have a thickness of 10 nm, and form a quantum wire structure.